

## C++ 程式設計題

命題者：TCC

題目名稱(中文/英文)：Complex

主要測試觀念：

### Basics

- ☒ C++ BASICS 1
- ☐ FLOW OF CONTROL
- ☒ FUNCTION BASICS
- ☐ PARAMETERS AND OVERLOADING
- ☐ ARRAYS
- ☒ STRUCTURES AND CLASSES
- ☒ CONSTRUCTORS AND OTHER TOOLS
- ☒ OPERATOR OVERLOADING, FRIENDS, AND REFERENCES
- ☐ STRINGS
- ☐ POINTERS AND DYNAMIC ARRAYS

### Functions

- ☐ SEPARATE COMPILATION AND NAMESPACES
- ☐ STREAMS AND FILE I/O
- ☐ RECURSION
- ☐ INHERITANCE
- ☐ POLYMORPHISM AND VIRTUAL FUNCTIONS
- ☐ TEMPLATES
- ☐ LINKED DATA STRUCTURES
- ☐ EXCEPTION HANDLING
- ☐ STANDARD TEMPLATE LIBRARY
- ☐ PATTERNS AND UML

題目說明：Define a class for complex numbers. A complex number is a number of the form

$$a + b*i$$

where for our purposes, a and b are numbers of type double, and i is a number that represents the quantity  $\sqrt{-1}$ . Represent a complex number as two values of type double. Name the member variables **real** and **imaginary**. (The variable for the number that is multiplied by i is the one called imaginary.) Call the class **Complex**. Include a constructor with two parameters of type double that can be used to set the member variables of an object to any values. Include a constructor that has only a single parameter of type double; call this parameter realPart and define the constructor so that the object will be initialized to realPart + 0\*i. Include a default constructor that initializes an object to 0 (that is, to 0 + 0\*i). Overload all the following operators so that they correctly apply to the type Complex: ==, +, -, \*, >>, and <<. You should also write a test program, tstComplex-main.cpp, to test your class. Of course, you can use input-main?.cpp instead.

輸入說明：此題無輸入。會提供測試用的 main()。

輸出說明：參考範例。

I/O 範例：

	Sample Input	Sample Output
第一組測資與輸出	input-main1.cpp input1.txt	output1.txt

附屬資料：

- ☒ 解答程式：complex.cpp, complex.h(檔名)
- ☒ 測試資料：input-main1.cpp, output1.txt, input1.txt, input-main2.cpp, output2.txt, input2.txt

- ☒ 易，僅需用到基礎程式設計語法與結構
- ☐ 中，需用到多項程式設計語法與結構
- ☐ 難，需用到多項程式結構或較為複雜之資料型態或結構

解題時間：30 分鐘。

其他註記：